

REMARKS

Claims 1-36 are currently pending in the subject application and are presently under consideration. Claim 1 has been amended on page 2 of the Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendment herein.

I. Summary of the Invention

Applicant's invention relates to presence tracking for datagram based protocols with search (e.g., network devices) that employs multicast-type messages transmitted in unicast to detect such devices. With the invention, a client application can dynamically determine if a network device is active thereby reducing network traffic related to discovering devices and/or services, and to searching for such devices and/or services.

In conventional datagram based discovery mechanisms and techniques, sign-on and sign-off messages are broadcast to nodes of a network during discovery processes and do not provide the temporal granularity that may be required by some applications that need to know frequently whether the device is present.

For example, the Universal Plug and Play specification (UPnP) specifies an M-SEARCH verb that allows a UPnP client application to search for UPnP devices. Normally, this M-SEARCH verb is sent as a multicast datagram for discovering devices. However, inappropriate usage of broadcast datagrams unnecessarily impacts the network bandwidth by transmitting the datagram to all devices in the multicast group when it is unnecessary to do so. Additionally, UPnP control point applications track presence of a device with a granularity no finer than a 30-minute minimum granularity, as specified by the UPnP specification. Moreover, these datagrams are more likely to be discarded by routers.

In accordance with one aspect of applicant's claimed invention, it is possible to send such M-SEARCH verbs as unicast datagrams to a specific destination device.

The destination device can receive the M-SEARCH verb on its port and can treat the multicast-type message as if it was a search request broadcast to all devices. The device can then respond with a directed search response. Accordingly, in the context of the single control object simply needing to know the status of the single target object, the on-

demand discovery message is in the format of multicast-type message transmitted as a unicast message to the target object. As a result, applicant's invention provides finer temporal granularity for object detection, while using less network bandwidth to discover the target device.

In addition, where a target object is multifunctional, one function may be totally functional while another function is not. Thus, a target object can be considered to be on-line with respect to a control object when it is in communication with the control object and functioning at the level sought to be statused. This means that the target object may be considered to be on-line for one desired function, but off-line for another. For example, if a first control object is interested only in a hardware status of the target object, and only the desired hardware function is operational, it is on-line with respect to that control object. If a second control object is interested only in a status of specific software running on the target object, which specific software is inoperative while the hardware is functional, the target object is off-line from the perspective of that second control object.

II. Rejection of Claims 1-10, 12-20, 22, 25-30, 32-34 and 36 Under 35 U.S.C. § 102(a)

Claims 1-10, 12-20, 22, 25-30, 32-34 and 36 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Jeong, *et al.* ("Service Discovery Based on Multicast DNS in Ipv6 Mobile Ad-hoc Networks"). Claims 1, 17, 26, 33, and 36 are the independent claims. Reconsideration and withdrawal of the rejection of claims 1, 17, 26, 33, and 36 (and associated dependent claims 2-10, 12-16, 18-20, 22, 25, 27-32. and 34) under 35 U.S.C. § 102(a) is respectfully requested in view of the comments below.

For a prior art reference to anticipate, 35 U.S.C. §102 requires that "***each and every element*** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950 (Fed. Cir. 1999) (*quoting Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)) (emphasis added).

As described above, applicant's invention provides target object presence tracking that employs ***multicast-type messages transmitted in unicast*** to detect such target objects, where the messages are of a multicast type but are transmitted in unicast to a specific object, rather than to multiple objects as would be the case for traditional multicast messaging.

In contrast, Jeong, *et al.* merely discloses a mechanism for service discovery in IPv6 mobile ad-hoc networks (MANETs), which use multicast DNS. The mechanism uses Link-Local Multicast Name Resolution (LLMNR) has been which comprises a Responder and Sender. Sender is the resolver that sends LLMNR query in link-local multicast and Responder is the name server that sends the LLMNR response to Sender in unicast. When Sender receives the response, it verifies if the response is valid. If the response is valid, Sender stores it in LLMNR cache and passes the response to the application that initiated the DNS query. Otherwise, Sender ignores the response and continues to wait for other responses.

In this regard, claims 1, 17, 26, 33, and 36 facilitates determining the presence of an object on a network. In particular, independent claims 1, 17, 26, 33, and 36 recite the similar limitation: ***transmitting a multicast-type message in unicast to the object***. Pages 1763 ll. 7-15, 1765, and 1766 are referred to in the Official Action for support that Jeong, *et al.* discloses transmitting a multicast-type message in unicast to the object. In contrast to applicant's invention, these pages, as well as the remainder of the publication, disclose ***messages sent in multicast with responses sent in unicast***: “sends LLMNR query in link-local multicast sends the LLMNR response to Sender in unicast” (p. 1763, col. 2, ¶ II.B); “Client sends the DNS SRV query to get the information of a service . . . via site-local multicast through ANS Resolver. The mobile node that can serve the queried service responds to the client query and delivers the data of SRV resource record to the client via site-local unicast.” (p. 1766, col. 1, ¶ III.B). As a consequence, while citation to such passages is reiterated for support that Jeong, *et al.* teaches applicant's claimed invention, the indicated passages clearly do not teach the features such as are ascribed to them in the Official Action.

More to the point, at page 1763 line 9 to line 15, Jeong, *et al.* describes that the Sender (of the multicast message) ignores an invalid response and waits for other

responses from another node capable of responding to the query. Thus it is clear from these passages that the Jeong, *et al.* system does not *transmit a multicast-type message in unicast to the object*, rather *Jeong, et al. sends a multicast message in multicast* to multiple nodes contrary to the interpretation ascribed to Jeong, *et al.* by Examiner, albeit in site-local scope.

Additionally, the request-response procedure of service discovery of Jeong, *et al.* is illustrated in Fig. 10, p. 1766 as SRV query transmitted via site-local multicast over UDP with the SRV response transmitted via site-local unicast over UDP. Thus it cannot be said that Jeong, *et al.* teaches applicant's claimed invention, because Jeong, *et al.* teaches messages sent in multi-cast; that is Jeong, *et al.* teaches message sent to more than one node. Because the Jeong, *et al.* messages are sent in multicast, Jeong, *et al.* cannot be said to teach or suggest, among other aspects of the claimed invention, *transmitting a multicast-type message in unicast to the object*. The rejection of claims 1, 17, 26, 33, and 36 (and associated dependent claims 2-10, 12-16, 18-20, 22, 25, 27-32, and 34) under 35 U.S.C. § 102(a) should be withdrawn in view of the comments above.

Moreover, claim 1 as amended recites “the object having . . . a plurality of functions capable of independent presence indication associated therewith and . . . if a response is not received, the object is presumed to be off-line with respect to the first set of one or more of the plurality of functions, the object is presumed to be on-line with respect to a second set of one or more of the plurality of functions” Because Jeong, *et al.* is silent with respect to such functionally granular presence detection, Jeong, *et al.* cannot be said to teach or suggest this aspect of the claimed invention. On this additional basis, the rejection of independent claim 1 (and associated dependent claims 2-16) under 35 U.S.C. § 102(a) should be withdrawn.

III. Rejection of Claims 11 and 21 Under 35 U.S.C. § 103(a)

Claims 11 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jeong, *et al.* as applied to claims 1 and 17 above, and further in view of Bhatti (US 2003/0140344 A1). Claims 11 and 21 are dependent claims depending directly from claims 1 and 17 respectively.

To reject claims in an application under § 103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some apparent reason to combine the known elements in the fashion claimed by the patent at issue (e.g., in the references themselves, interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace, or in the knowledge generally available to one of ordinary skill in the art). To facilitate review, this analysis should be made explicit. Second, there must be a reasonable expectation of success. *Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.* See MPEP § 706.02(j). See also *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. ___, 04-1350, slip op. at 14 (2007). The reasonable expectation of success must be found in the prior art and not based on applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added).

Regarding claims 11 and 21, Bhatti is silent with respect to *transmitting a multicast-type message in unicast to the object*, and thus cannot be said to cure the deficiency of the root reference, Jeong, *et al.* For at least this reason, reconsideration and withdrawal of the rejection of claims 11 and 21 under 35 U.S.C. § 103(a) is respectfully requested in view of the comments above.

IV. Rejection of Claim 23 Under 35 U.S.C. §103(a)

Claim 23 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Jeong, *et al.* as applied to claims 17 and 22 above, and further in view of Shrinivasan *et al.*, (US 2002/0174237). Claim 23 is a dependent claim depending directly from claim 17. Regarding claim 23, Shrinivasan *et al.* is silent with respect to *transmitting a multicast-type message in unicast to the object*, and thus cannot be said to cure the deficiency of the root reference, Jeong, *et al.* For at least this reason, reconsideration and withdrawal of the rejection of claim 23 under 35 U.S.C. § 103(a) is respectfully requested in view of the comments above.

V. Rejection of Claims 24, 31 and 35 Under 35 U.S.C. §103(a)

Claims 24, 31, and 35 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jeong, *et al.* as applied to claims 17 and 26 above, and further in view of Devine *et al.*, (US 2002/0095399). Claims 24, 31, and 35 are dependent claims depending directly from claims 17, 26, and 33 respectively. Regarding claims 24, 31, and 35, Devine *et al.* is silent with respect to *transmitting a multicast-type message in unicast to the object*, and thus cannot be said to cure the deficiency of the root reference, Jeong, *et al.* For at least this reason, reconsideration and withdrawal of the rejection of claims 24, 31 and 35 under 35 U.S.C. § 103(a) is respectfully requested in view of the comments above.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendment. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicant's undersigned representative at the telephone number below.

Respectfully submitted,
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